

# Direct Push Mobile Technology Used for Real-Time Determination of Volatile Organic Compounds (VOCs) in Groundwater and Soil

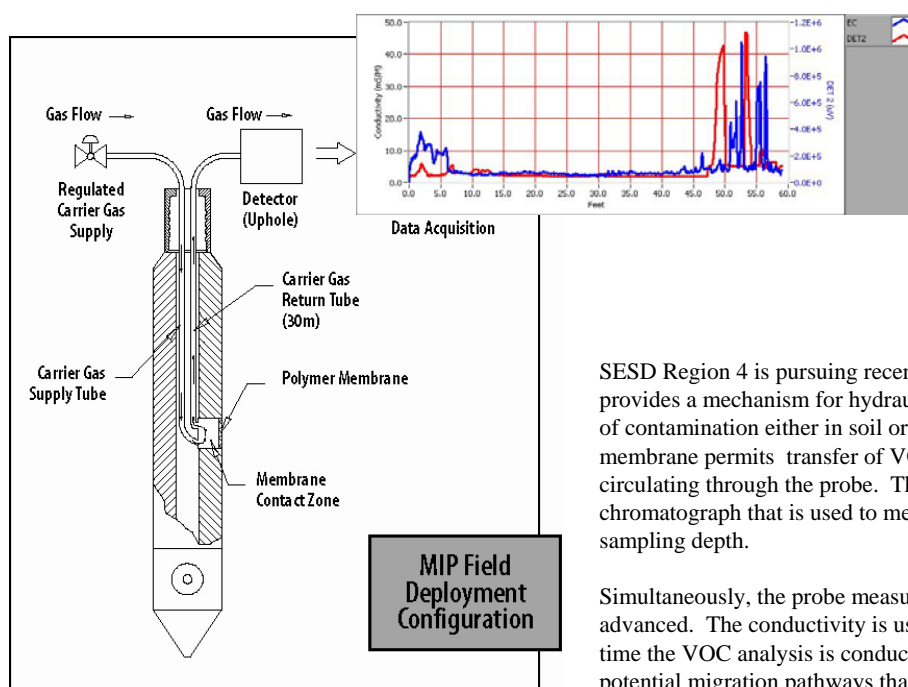
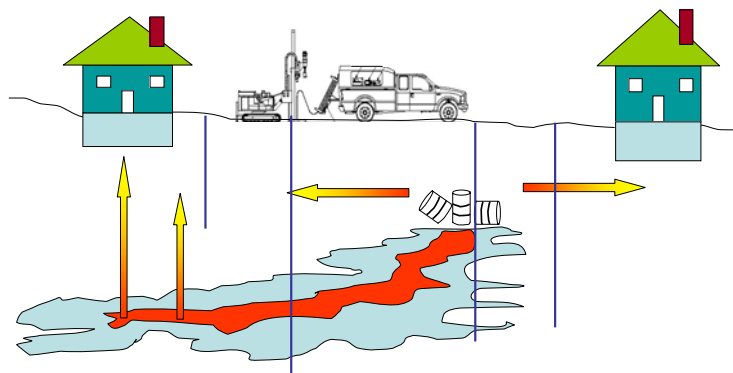
Tim Slagle<sup>1</sup>, Michael Crow<sup>2</sup>, Frank Allen<sup>2</sup>, Brian Striggow<sup>1</sup>, Stacey Box<sup>1</sup>, Martin Allen<sup>1</sup>

<sup>1</sup>Region 4 SEDS, Athens, Georgia

<sup>2</sup>Integrated Laboratory Systems Inc., Athens Georgia

Conducting the analysis of (volatile organic compounds) VOCs contained in contaminated soils and groundwater in the field has many advantages. The greatest advantage is the ability to provide real time field analysis that can be used to determine if the contamination poses a potential threat to residents located near the proximity of the plume.

Contaminated groundwater as a result of spills or buried materials is a danger to residents who use well water as their source of drinking water. In addition, the groundwater provides a conduit for spreading the contamination over a larger area, possibly under homes and other buildings. The VOCs contained in the contaminated ground water plume then have the potential to migrate through the soil and into the homes and buildings above the plume. This migration of VOCs through the soil into buildings is called vapor intrusion, and is a growing health concern.



SESD Region 4 is pursuing recent technological advances in direct push technology that provides a mechanism for hydraulically pushing a probe through the soil to locate a zone of contamination either in soil or groundwater. The probe, which has a heated permeable membrane permits transfer of VOCs from the groundwater or soil to a carrier gas circulating through the probe. The carrier gas containing the VOCs is transferred to a gas chromatograph that is used to measure the total concentration of all VOCs present at the sampling depth.

Simultaneously, the probe measures the electrical conductivity of the soil as it is advanced. The conductivity is used as an indicator of the probable soil types at the same time the VOC analysis is conducted. Soil type characterization is useful in determining potential migration pathways that contaminants may follow.



epa**science**forum  
Collaborative Science  
for Environmental Solutions



2005  
epa.gov/scienceforum